

U.S. DEPARTMENT OF COMMERCE  
National Technical Information Service

PB-260 037

DEMONSTRATION PROJECT ABSTRACTS  
SOLID WASTES PROGRAM  
SUPPLEMENT A

NATIONAL CENTER FOR URBAN AND INDUSTRIAL HEALTH  
CINCINNATI, OHIO

AUGUST 1967

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Supplement A

DEMONSTRATION  
PROJECT  
ABSTRACTS

SOLID  
WASTE  
PROGRAM

REPRODUCED BY  
NATIONAL TECHNICAL  
INFORMATION SERVICE  
U. S. DEPARTMENT OF COMMERCE  
SPRINGFIELD, VA. 22161

Department of Health, Education & Welfare  
Public Health Service  
SW163

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| <b>BIBLIOGRAPHIC DATA SHEET</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | 1. Report No.                                    | 2.                     | 3. Recipient's Accession No.<br>PB-260 037 |
| 4. Title and Subtitle<br>Demonstration Project Abstracts, Solid Wastes Program. Supplement A.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  | 5. Report Date<br>Aug 67                         |                        |                                            |
| 7. Author(s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | 6.                                               |                        |                                            |
| 9. Performing Organization Name and Address<br>National Center for Urban and Industrial Health,<br>Cincinnati, Ohio.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  | 8. Performing Organization Rept. No.             |                        |                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | 10. Project/Task/Work Unit No.                   |                        |                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | 11. Contract/Grant No.                           |                        |                                            |
| 12. Sponsoring Organization Name and Address                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | 13. Type of Report & Period Covered              |                        |                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | 14.                                              |                        |                                            |
| 15. Supplementary Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                  |                        |                                            |
| 16. Abstracts<br><br>The abstracts in this supplement describe projects that were given awards by the Solid Wastes Program of the Public Health Service's National Center for Urban and Industrial Health. The projects are of two kinds. Some are designed to demonstrate the feasibility of new and improved technology for solid waste disposal. Other investigate the development of area-wide solid waste management systems to replace unsanitary and uneconomic operations by individual communities. The Solid Wastes Program is aimed at initiating across the nation the adoption of practices and systems for disposing of solid wastes which protect human health and scenic beauty. |  |                                                  |                        |                                            |
| 17. Key Words and Document Analysis. 17a. Descriptors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                                                  |                        |                                            |
| 17b. Identifiers/Open-Ended Terms<br>Solid waste disposal                      Waste water reuse                      Salvage<br>Waste processing                      Sewage treatment<br>*Waste management                      Refuse disposal<br>*Solid waste treatment                      Incineration<br>Solid waste collection systems                                                                                                                                                                                                                                                                                                                                                  |  |                                                  |                        |                                            |
| 17c. COSATI Field/Group                      13B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                                                  |                        |                                            |
| 18. Availability Statement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | 19. Security Class (This Report)<br>UNCLASSIFIED | 21. No. of Pages<br>32 |                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | 20. Security Class (This Page)<br>UNCLASSIFIED   | 22. Price              |                                            |

Supplement A

D E M O N S T R A T I O N

P R O J E C T

A B S T R A C T S

S O L I D

W A S T E S

P R O G R A M

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
Public Health Service

Bureau of Disease Prevention and Environmental Control

National Center for Urban and Industrial Health

Solid Wastes Program, Solid Wastes Information Retrieval System

Cincinnati, August 1967

## FOREWORD

The abstracts in this supplement describe projects awarded since publication of our March, 1967, issue. These projects have received awards covering up to two-thirds of project costs as authorized by the Solid Waste Disposal Act of 1965. The awards were made by the Solid Wastes Program of the Public Health Service's National Center for Urban and Industrial Health.

The projects are of two kinds. Some are designed to demonstrate the feasibility of new and improved technology for solid waste disposal. Others investigate the development of area-wide solid waste management systems to replace insanitary and uneconomic operations by individual communities.

The Solid Wastes Program, as outlined in the Act, is aimed at initiating across the Nation the adoption of practices and systems for disposing of solid wastes which protect human health and scenic beauty.

In addition to demonstration projects, the Program supports research and training in solid wastes management, provides up to 50 percent support for statewide solid waste program planning, and assists local and State governments with technical problems.

Project Type: Study/Invest/Demon. Grant Agency No. 3-D01-SW-00018-02S1

Title: Land Reclamation by Accelerated Stabilization and Related  
Studies of Compactor Equipment

Project Director: Ralph Stone  
President  
Ralph Stone & Company, Inc. Engineers  
10964 Santa Monica Boulevard  
Los Angeles, California 90025

Amount & Year: \$63,350 -01                      \$45,120 -02

Started: June 1, 1967                      Expected Finish: May 31, 1969

Objective: To compare the densities achieved in sanitary landfills using conventional and self-propelled compaction equipment.

Procedures: The first phase of this project will be to analyze compaction achieved using conventional equipment. The D-9 caterpillar and F. W. Wagner WC-17 rubber-tire compactor will be used. The second phase will be to determine the compaction obtained using the SF-17 Wagner steel-tire compactor and compare this data to that obtained in the first phase. Tests will be conducted regularly to determine refuse composition, percent moisture, percent inerts, settlement of test cells, and bearing capacity of test cells. A final report will conclude the project which will evaluate the technical, economic and environmental aspects of landfill compaction using various types of mechanical equipment.

Project Type: Study/Invest/Demon. Grant Agency No. 2-D01-SW-00038-02

Title: Incinerator No. 5-Phase II-Design

Project Director: William F. Young, Chief  
Project Development & Engineering Branch  
Department of Sanitary Engineering  
Government of the District of Columbia  
14th and E Streets, N. W.  
Washington, D. C. 20004

Amount & Year: \$390,081 -01

Started: June 1, 1967

Expected Finish: May 31, 1968

Objective: To study, investigate, and develop a design for a solid waste incinerator installation, together with satellite equipment, capable of reducing the volume of all categories of solid wastes (exclusive of excavated and demolition non-combustible materials) for disposal in sanitary landfills.

Procedures: The District of Columbia Department of Sanitary Engineering Proposes to make a comprehensive investigation of the design features, and design of a continuous feed incinerator and appurtenances. Investigations will be conducted to determine the performance of special equipment (e. g. mechanical collectors and electrostatic precipitators) and to develop design modifications which will make them suitable for use in municipal solid waste incineration. Size reduction of large combustible objects by a large hammer mill will be investigated and if proven feasible will be incorporated into the design. Special control and research laboratory facilities will also be included in the design of the incinerator so that a thorough evaluation can be made on the refuse incinerator while operating under all conditions. Included in the study will be an investigation of procedures and actions which a municipality must take for interim disposal of solid wastes during design and construction of a permanent facility. The design of this incinerator also will demonstrate how to incorporate a single jurisdiction's solid waste facility into a long range regional plan.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00040-01

Title: Solid Waste Disposal by Incineration, Using an  
Incineration with Characteristics Requiring Minimum  
Control Equipment

Principal Investigator(s): Geertz, C.; Galli, G.;  
Feldstein, M.; and Johnson, H.

Project Director: Clifford J. Geertz, City Engineer  
Room 359, City Hall  
San Francisco, California

Amount & Year: \$175.790 - 01; \$233.290 - 02; \$235.790 -03

Started: April 1, 1967 Expected Finish: March 31, 1970

Objectives: Develop, design and construct a municipal type refuse incinerator with operating characteristics that would meet the requirements of the several air pollution control districts in the Pacific Coastal area with a minimum of control equipment.

Procedures: Incineration process features which will be studied, developed, fabricated and tested include;  
1) a mechanical grate capable of functioning with a minimum of excess air; 2) multiple chamber furnace without "conventional" bridge and/or curtain wall; 3) a secondary chamber located to obtain turbulence and complete burnout of gases; 4) air jets for inducing turbulence and mixing at the entrance to the secondary chamber; and 5) a fly ash scrubber, which, when used in conjunction with the other components, would produce an effluent capable of meeting air pollution regulations. Design factors would be evaluated by testing under varying conditions of operation. Construction, maintenance and operating costs information will be developed for a unit capable of handling 100 to 150 tons per day.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-0057-1

Title: Refuse Crusher - Tacoma, Washington

Project Director: Gilbert M. Schuster, P. E.  
Director of Public Works  
City of Tacoma  
930 Tacoma Avenue South  
Tacoma, Washington 98402

Amount & Year: \$158,036 - 01 \$198,932 -02 \$78,854 -03

Started: June 1, 1967

Expected Finish: May 31, 1970

Objective: To demonstrate the feasibility of disposing demolition wastes by shredding and compacting into a sanitary landfill. This operation will help to eliminate the City of Tacoma's current air pollution problem caused by open burning of demolition waste. By reducing the bulk of the material to a more practical size, the disposal of this material in a sanitary landfill becomes more practical.

Procedures: In the first year of the project, scales and a scale house will be purchased and installed. A metal wheel compactor will also be purchased. A three phase, 18-month evaluation of the project will then be conducted in the city's sanitary landfill. During Phase I the sanitary landfill will be operated under controlled conditions using solid wastes without demolition material. Accurate records of the volume and weight of the regular solid wastes will be kept. During Phase II the landfill will be operated under controlled conditions incorporating unshredded demolition waste. The weight and volume of material used in the landfill will be recorded. Prior to Phase III a hammer shredder will be purchased and will be used in Phase III to combine shredded demolition waste with the regular solid waste at the sanitary landfill. The weight and volume of waste will be recorded both before and after the shredding process. The evaluation of this project will include the investigation of the sources of solid wastes for inclusion in the sanitary landfill as well as the practical and economical aspects of this disposal process.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00060-01

Title: Des Moines Metropolitan Area Solid Waste Study and Investigation

Project Director: Leo L. Johnson, P. E.  
Director of Public Services  
City of Des Moines  
City Hall  
Des Moines, Iowa 50309

Amount & Year: \$109,483 - 01

Started: April 1, 1967

Expected Finish: March 31, 1968

Objective: To make a comprehensive and detailed analysis of present solid waste collection and disposal operations on a metropolitan basis (the study area consists of the city of Des Moines, twelve surrounding communities, and portions of two counties), and from this analysis make a recommendation which will suggest the best method for collection and disposal both now and in the future.

Procedures: The consulting firm, Henningson, Durham, and Richardson, is employed to conduct this study. This firm in cooperation with the project staff plans to include the following actions in its study: 1) analyze the quantities and nature of wastes, 2) review present solid waste collection practices and cost analysis methods, 3) analyze existing disposal methods and investigate possible disposal methods, 4) investigate existing laws regulating solid waste collection and disposal operations, 5) analyze existing administrative procedures, and 6) determine the best method for financing both the capital and operating costs of the recommended program

The analysis of collection and disposal data will be handled by computer programming for determining now and maintaining in the future the most economical and feasible system for these operations.

The final report will include recommendations dealing with legislation, financing, system of administration, type and location of disposal sites, system of collection, and the method for coordinating all of these interrelated factors.

Project Type: Study/Invest/Demon. Grant Agency No. 1-001-SW-00061-01

Title: Investigate and Evaluate Feasibility of Refuse Baling as  
a Means of Conserving Sanitary Fill Space - San Diego,  
California

Project Director: Eric Quartly  
Public Works Director  
City of San Diego  
City Administration Building  
San Diego, California 92101

Amount & Year: \$90,900 - 01

Started: June 1, 1967

Expected Finish: May 31, 1968

Objective: The City of San Diego, California proposes to investigate and analyze refuse baling in comparison with its present Sanitary Landfill Conservation Methods to determine the relative efficiency and economics of refuse baling as a means of extending the life of sanitary landfill sites and reducing the haul distance of its refuse collection vehicles. This study and investigation will be oriented towards determining whether the construction of a pilot baling station as a demonstration project is feasible.

Procedures: The procedures to be used during the course of this project are the following:

- (1) Contact national and international baling companies to determine the variety and capabilities of the equipment available or adaptable for baling of refuse.
- (2) Obtain suitable balers from local businesses and conduct initial tests evaluating the various refuse baler equipment available to determine which is most suitable for use in pilot operations.
- (3) Compile data on costs and the compaction achieved with the present sanitary landfill operations as the basis for evaluating the potential economics feasibility of refuse baling.
- (4) Evaluate the economics of a baling/transfer station operation versus a direct haul operation with baling at the final site.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00063-01A1

Title: Development of Master Plan for Solid Waste Collection  
and Disposal - New Orleans, Louisiana

Project Director: F. Earl Berry  
Superintendent of Sanitation  
Room 2W13 - City Hall  
New Orleans, Louisiana 70112

Amount & Year: \$117,913.07 - 01

Started: June 1, 1967

Expected Finish: May 31, 1968

Objectives: To analyze present collection and disposal facilities and procedures employed for residential and commercial wastes, and to recommend a master plan for the next twenty years for an integrated collection and disposal facility for the New Orleans Metropolitan Area.

Procedures: The development of a master plan for the New Orleans Metropolitan Area will proceed in three phases:

Phase 1) A population and economic study will be conducted to determine the present status and expected growth of the area for the next twenty years.

Phase 2) The present collection and disposal system will be evaluated and other such systems will be studied.

Phase 3) An economic and financial study will be made of the collection and disposal systems presented in Phase 2 and final recommendations will be made for a program of solid waste methods and procedures for the next two decades and its development by stages to meet public need and protect public health.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00069-01

Title: Farmington River Valley Solid Waste Disposal Study  
and Investigation

Project Director: Stephen A. Flis  
Town Manager  
Town of Farmington  
Town Hall  
Unionville, Connecticut 06085

Amount & Year: \$28,991 - 01 \$30,180 -02

Started: April 1, 1967 Expected Finish: March 31, 1969

Objective: Determine the practicality and relative economic advantages of providing refuse disposal service for sub-regional, low-density population areas through a cooperative, five-town group effort.

Procedures: The primary objective of this project will be achieved by: 1) analyzing refuse collection and transportation costs under different methods and different collection frequencies while providing uniform and better service to the homeowner; 2) determining the location, size and availability of refuse disposal facilities that will best serve this group of towns and contiguous municipalities if economic considerations so indicate; 3) determining the types and the cost of refuse disposal facilities that will most efficiently serve these towns; 4) evaluating the possibility of employing several disposal methods in the refuse disposal system; 5) setting up a training program for personnel operating solid waste services including administrative rules and procedures - this advice would be available to other municipalities with similar problems; 6) establishing and recommending for adoption uniform refuse handling and storage procedures at the household level, and 7) establishing procedures for the disposal of tree trimmings, logs, stumps and bulky objects, including junk cars.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00070-01

Title: Solid Waste Disposal Study for Flint and Genesee  
County Metropolitan Area, Michigan

Project Director: Thomas H. Haga, Director-Coordinator  
Genesee County Metropolitan  
Planning Commission  
511 Courthouse  
Flint, Michigan 48502

Amount & Year: \$64,063 -01 \$3,770 -02

Started: April 1, 1967 Expected Finish: March 31, 1969

Objective: To conduct a thorough solid waste disposal study for Genesee County. This study will include: 1) a quantitative and qualitative analysis of the solid waste produced. 2) an inventory of present solid waste disposal facilities. and 3) recommendations which will enable Genesee County to meet its future solid waste disposal needs.

Procedures: The project staff in cooperation with all governmental units, private haulers, and commercial and industrial organizations will determine the composition of solid waste produced in the study area and locate all disposal areas and facilities, including size, availability of utilities, and any special characteristics. The consultant, Consoer, Townsend, and Associates, will conduct sufficient additional qualitative and quantitative studies so that the solid waste disposal needs of Genesee County can be projected to the year 1995. With this information the consultant will then prepare a report and recommendations for an efficient solid waste collection and disposal system (including preliminary cost estimates) for the Flint metropolitan area and the entire county.

Since this project is being supported by industry and government, the project staff in conjunction with the consultant will attend any and all meetings necessary to explain the proposed recommendations to all governmental units and interested civic and industrial organizations in the study area in an effort to secure approval of the proposed recommendations.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00072-01

Title: Solid Waste Collection and Disposal Study- Harrison  
County, Mississippi

Project Director: To Be Named

Amount & Year: \$50.000 - 01

Started: June 1, 1967

Expected Finish: May 31, 1968

Objective: To make a comprehensive study of solid waste collection and disposal practices within Harrison County, Mississippi, and to develop a twenty-year plan for collection and disposal practices within the area. Further it is intended to integrate the present separate solid waste collection and disposal facilities of the individual municipalities into an overall county system.

Procedures: The County of Harrison, Mississippi, has retained the services of Albert Switzer & Associates, Inc. of Mississippi to provide the engineering services required to fulfill the objectives of the project. These services will be conducted in a three phase operation. Phase one will include a population and economic study on present and future conditions in the County. Phase two will prepare and present the Master Waste Collection and Disposal Plan for the County. This will involve conducting studies on present and future waste collection and disposal systems needed for the area. During Phase three an economic and financial study will be conducted on the collection and disposal systems proposed in phase two. Recommendations will be made in a final report on the facilities and methods needed by the County to conduct an efficient and economical solid wastes collection and disposal program.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00073-01

Title: Investigate the Potential Benefits of Rail Haul as  
an Integral Part of Waste Disposal Systems

Project Director: Dr. Karl W. Wolf  
Research Associate  
American Public Works Association  
Research Foundation  
1313 East 60th Street  
Chicato, Illinois 60637

Amount & Year: \$257,800 - 01 \$88,300 -02 \$68,700 -03

Started: April 1, 1967 Expected Finish: March 31, 1970

Objective: The project staff intends to make a thorough and comprehensive evaluation of the costs and benefits obtainable for the collection, transportation and disposal of solid wastes from urban areas by the use of rail-haul techniques.

Procedures: The project consists of three major phases--one phase occurring each year. Phase One is concerned with the identification, development and setting up of the rail haul and related solid waste transport and disposal techniques. Phase Two implements the rail haul waste disposal concept in cooperation with a selected number of communities. Phase Three concludes the project by a comprehensive evaluation of the concept and techniques of Phase Two.

More detailed steps in the various phases of the procedure consist of applying systems analysis techniques to the time and cost aspects of the project. Likewise, the project task force will meet periodically to evaluate and enhance the systems analysis schedules, the ground rules, and the individual assignments through constructive criticism. After the first phase-year of the project, a final report covering the first year's work will be written. This detailed and documented report, in conjunction with a procedural manual shall explain how rail-haul concepts can be applied to various types and kinds of communities. Furthermore, by the end of the first year a number of demonstration projects hopefully will be set up in a selected number of communities so that actual operations will commence at the beginning of the year. These operations will be conducted in close cooperation with the New York Central Railroad.

Project Type: Study/Invest/Demon. Grant Agency No. L-D01-SW-00076-01A1

Title: Solid Waste Disposal Study and Investigation Project  
Grant - Brockton, Massachusetts

Project Director: Alvin Jack Sims  
Mayor, City of Brockton  
City Hall  
Brockton, Massachusetts 02401

Amount & Year: \$27.450 - 01

Started: June 1, 1967 Expected Finish: August 31, 1967

Objective: To investigate and evaluate the Melt-Zit high temperature pilot incinerator at Whitman, Massachusetts. The purpose of this study will be to determine the feasibility of such a system for the City of Brockton and the several contiguous towns comprising the Brockton Standard Metropolitan Statistical Area (SMSA).

Procedures: The Melt-Zit high temperature pilot incinerator at Whitman, Massachusetts will be tested and evaluated. The tests will show operating costs and results of the incinerator and particulate matter in the gases as well as gas analyses. The owner of the plant, the American Design & Development Corporation, will make available the incinerator, operate it, and furnish instrumentation. The City of Brockton will furnish refuse needed for the tests in quantity up to 100 tons per day. The tests will be conducted in two periods of five days each. One period will provide for eight hour per day operation and the other will provide for continual operation. Professor Kaiser of New York University will have the responsibility of conducting the operations tests, analyzing samples of refuse and end products, and preparing a report describing the test results. Mr. Fred Rehm will measure and report on the gas analyses. Fay, Spofford, and Thorndike, Consulting Engineers will provide general supervision.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-C0078-1

Title: Problems and Solutions in Regional Approach to Incineration  
of Solid Wastes - Central Wayne County, Michigan

Project Director: Virgil E Eller  
Superintendent  
Central Wayne County Sanitation Authority  
4901 Inkster Road  
Dearborn Heights, Michigan 48125

Amount & Year: \$98.700 -01

Started: June 1. 1967

Expected Finish: May 31. 1968

Objective: The Central Wayne County Sanitation Authority proposes to demonstrate the advantages of installing Fly Ash Slurry Treatment and the savings that can be accomplished in water costs, sanitary sewer maintenance and general operation.

Procedures: The consulting engineering firm of Pate, Hirn & Bogue, Inc. will conduct the demonstration project in three stages. The first stage will consist of a complete investigation and evaluation of existing systems as well as equipment and materials available for pumping, conveying and treating the fly ash relative to treatment efficiency and partial recovery of process water. At the same time a detailed study of the plant and the quantity and quality of the waste will be made. The second stage will consist of the preparation of plans and specifications using the selected system. Competitive bids will be received; the treatment facility will be constructed and placed in operation. The third stage will consist of testing and evaluating the system. Data on flow, solids volume, efficiency of solids removal, water saved and the effects on the sanitary sewers will be collected. A report will be written covering this test data and results.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00080-01

Title: Agricultural Benefits and Environmental Changes from  
Use of Digested Sewage Sludge on Field Crops

Project Director: Charles T. Mickle, Chief Engineer  
The Metropolitan Sanitary  
District of Greater Chicago  
100 East Erie Street  
Chicago, Illinois 60611

Amount & Year: \$494,000 - 01 \$207,000 - 02 \$213,000 - 03

Started: April 1, 1967

Expected Finish: March 31, 1970

Objective: To determine the practicality of disposing of digested sewage solids on land with primary consideration given to: 1) investigation of factors relevant to the contamination of surface water and groundwater, and 2) investigation of factors relevant to the pollution of soils with heavy metals, highly soluble salt concentrations, grease and organic compounds inherent in the sewage sludge, and 3) investigate factors relevant to the method, frequency, rate, and time for safely applying digested sewage sludge on sandy soil.

Procedures: The field installation will consist of 36 plots, 30 feet long and 20 feet wide, separated on each side by a 20 foot border and sealed to prevent lateral water movement.

Field infiltration tests with water will be conducted periodically after various rates of digested sludge have been applied to the land in order to evaluate the risk of contaminating surface water by runoff from rain water.

Clay drainage tile will be placed at a depth of five feet through the center of each plot. This tile will convey the drainage water to an instrument house for chemical and biological analyses.

Laboratory, greenhouse, and field analyses on plant growth under the various rates and frequencies of digested sewage sludge application will be conducted to determine which crops and crop practices obtain the greatest extraction of heavy metals and soluble salts.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00081-01

Title: Illinois Auto Salvage Waste Pollution Control

Project Director: Larry Goddard  
Executive Director  
Illinois Auto Salvage Dealers Association  
612 South Second Street  
Springfield, Illinois 62704

Amount & Year: \$40,820 -01

Started: June 1. 1967

Expected Finish: May 31, 1968

Objective: To develop a program for automotive salvage dealers in Illinois for upgrading the disposal of solid wastes to eliminate problems currently affecting the health and welfare of the public and to prevent the development of future problems of this character.

Procedure: Illinois auto salvage dealers are pressed by public agencies to improve their solid wastes disposal to eliminate health and welfare problems resulting from current practices and to modify their operations to prevent future public health problems. The applicant representing the dealers of Illinois has retained the consulting firm of Crawford, Murphy, and Tilly, Inc. to conduct a study of the problem and to provide information and recommendations. Guidelines will be prepared for the collection, handling, storage, and processing of abandoned autos. The location and extent of activities of auto salvage dealers within the state will be determined. A complete survey will be made of the literature related to automotive salvaging including incineration, shredding and compacting of automobiles. An economic study will be made so as to determine the impact of upgrading the handling, processing, storage, and disposal of automobiles.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00082-01

Title: Control of Dust in Handling of Solid Wastes

Project Director: Allan J Kronbach  
Assistant General Manager  
P. O. Box 1234  
Berkley, Michigan 48072

Amount & Year: \$40,000-01

Started: June 1, 1967

Expected Finish: May 31, 1968

Objective: To study and investigate the feasibility and economic practicability of controlling the spreading of dust into the atmosphere within the incinerator building and environment during the process of handling solid waste material for disposal. If the results of the study show merit, the design, installation, and demonstration of the dust equipment will follow.

Procedures: The Southeastern Okland County Incinerator Authority plans to conduct a study to find new methods for controlling dust within incinerator plants or handling areas. The proposed study would include development of such dust control plans, economic evaluations of the plans and economic feasibility reports of the most promising plans. Basic criteria for the dust control plans would be development of a system designed to achieve:

1. "Capture" of air borne dust particles as near the point of generation as possible.
2. No reduction in incinerator efficiency.
3. A decrease in the atmospheric air pollution in and adjacent to the plant.
4. Elimination of discomfort to the plant personnel and truck drivers.
5. Maintain normal atmospheric pressures in the building.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00084-1

Title: Western Jefferson County, Wisconsin Solid Waste Disposal Study

Project Director: Bruce O. Frudden, P.E.  
Mead and Hunt, Inc.  
P.O. Box 5247  
Madison, Wisconsin 53705

Amount & Year: \$6,500.00 -01

Started: June 1, 1967

Expected Finish: May 31, 1968

Objective: To determine the feasibility of a joint solid waste disposal system for the communities of Fort Atkinson, Jefferson, Lake Mills, Waterloo, Johnson Creek, and the surrounding rural township. Special consideration will be given to the establishment of a utility to operate a solid waste disposal system for the subject communities.

Objective: The entire study will be performed by a consultant firm. Mead & Hunt, Inc. and will be compiled into a report. The scope of the study will include consideration of the following items:

- 1) Population and projected increase.
- 2) Type and quantity of refuse and projected increase.
- 3) Present collection methods, frequency of pick-ups, equipment, personnel and costs.
- 4) Review of available methods of disposal including landfill, incineration, garbage grinding and digestion, milling, and others.
- 5) Analysis of refuse disposal projects that appear feasible for the area being studied.
- 6) Cost estimates for each type of project analyzed, including capital expenditure and annual operating costs.
- 7) Conclusions and recommendations.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00087-1

Title: Tocks Island Regional-Interstate (Pennsylvania, New Jersey and New York) Solid Waste Management Study

Project Director: Frank W. Dressler, Executive Director  
Tocks Island Regional Advisory Council  
612 Monroe Street  
Stroudsburg, Pennsylvania 18360

Amount & Year: \$84,510 -01 \$107,490 -02

Started: June 1, 1967

Expected Finish: May 31, 1969

Objective: Demonstrate regional interagency solid waste planning under the leadership of a new type of regional agency, The Tocks Island Regional Advisory Council (TIRAC) which is an organization of representatives from the six member counties in the tri-state region affected by the Delaware Water Gap National Recreation Area and explore and demonstrate the feasibility of resolving a major environmental health problem (solid waste disposal) on a regional bases inter-local and/or inter--local, interstate co-operation and action.

Procedures: The study will be carried out through a combination of staff and consultant activities supplemented with information and studies to be provided by the three state health agencies and by information supplied by the Delaware River Basin Commission environmental study currently underway. The three states involved, Pennsylvania, New Jersey and New York will undertake a special "Legislative Study" to determine the legal powers and responsibilities which exist in the solid waste field at the state regional, county and local levels of government. A detailed work program will investigate a "systems planning" approach which may provide cost effectiveness data on various plans to be developed and will also permit the study readily to be updated in the future. Three committees, a steering committee, a technical advisory committee and a solid waste management committee, each composed of one members of each of the participating agencies will be established to insure successful execution and eventual implementation of the recommendations of the study.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00089-01

Title: Incinerator Water Treatment System and Air Pollution Scrubber Test

Project Director: Wayne Seifert  
Plant Superintendent  
Whitemarsh Township Authority  
Township Building  
Lafayette Hill, Pennsylvania 19444

Amount & Year: \$145,000-01  
\$18,000-02  
\$18,000-03

Started: June 1, 1967

Expected Finish: May 31, 1970

Objective: To test the effectiveness of the waste water treatment system for clarifying and reusing waste water in incinerators and to test the air pollution control effectiveness of the flooded baffle scrubber.

Procedures: The 300 ton per day single furnace Whitemarsh Authority incinerator has recently been renovated. Part of the renovation included the installation of a closed water handling and treatment system and an air pollution control scrubber. The water treatment system proved to be inadequate. A new system has been developed utilizing a chemical treatment for precipitation and pH control. a grit chamber type process water clarifying unit consisting of a thickening mechanism and a dewatering mechanism. and lagoons for final clarification. The project will concern the construction and testing of this new system. The designers feel that the new treatment system will demonstrate successfully. that incinerator waste-water can be properly treated and re-used. and that the air pollution control scrubber will provide adequate protection.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00090-1

Title: Study and Investigation of Solid Waste in Appalachian  
Regional Demonstration Health Area- Ten counties in  
West Virginia

Project Director: O. R. Lyons, Director  
Solid Waste Disposal Planning  
West Virginia State Department of Health  
Charleston, West Virginia 25305

Amount & Year: \$14,425 - 01

Started: June 1, 1967

Expected Finish: May 31, 1968

Objective: To survey and identify quantity and character of existing solid waste conditions in the region for now and in the future, to study the inter-county approach to solution of solid waste problems involving ten counties in a depressed area and develop a regional plan for waste disposal including a forecast of future needs of the region.

Procedures: The study will be conducted by members of the engineering faculty at the West Virginia Institute of Technology. Dr. L. M. Blockwell, Director of Engineering will be in overall charge of the study. Three field men will conduct investigations in the area to obtain such information as amounts and kinds of waste generated in the area and present means of disposal. From these data the area will be divided into waste disposal zones using volume of waste and existing transportation facilities as guides. The disposal problems of each of these zones will be dealt with on an individual basis. At this time any discrepancies of deficiencies in data will be reviewed and corrected. Various meetings with the Southern West Virginia Regional Health Council are planned so that the final report will reflect both the engineering judgment of the study group and the ideas and concerns of the Council.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00091-01

Title: Bulk Refuse Crusher Facility-Buffalo, New York

Project Director: Leonard S. Wegman  
Leonard S. Wegman Company  
101 Park Avenue  
New York, New York 10017

Amount & Year: \$380,200 -01  
\$392,300 -02  
\$ 35,100 -03

Started: June 1, 1967

Expected Finish: May 31, 1970

Objective: To demonstrate the feasibility of presizing bulky municipal refuse prior to disposal by incineration, thus increasing the ability of new and existing incinerators with limited-size charging openings to handle bulky waste that is presently finding its way to open dumps and open burning.

Procedures: The City of Buffalo proposes to install a bulk refuse crusher as an addition to a municipal incinerator which today has no air pollution equipment. The present incinerator has batch feed furnaces and expansion and subsidence chambers. It is designed to handle 400 tons of refuse per day. In addition to the bulk refuse crusher, a completely new incinerator train consisting of a continuous stoker type furnace, a special chamber to accept and burn bulky uncrushed items, an enlarged wet bottom settling chamber, a spray chamber, and cyclone fly ash collectors to provide air pollution controls will be installed. The furnaces in the existing plant will be upgraded with similar air pollution control devices. The enlargement will increase the plant capacity to 660 tons per day.

Accurate records will be kept of the operation to establish the quantities, weight and characteristics of the material processed. Records on the bulk refuse crusher will also provide data as to power, consumption, maintenance, labor and other costs to determine the economic feasibility of wide-spread use of such a facility by other communities faced with the problem of oversized discard disposal.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00092-01

Title: Economic Feasibility of Composting Refuse and Sewage  
Sludge in Southeastern Michigan-Riverview, Michigan

Project Director: Milton D Redlick  
Civil Engineer  
Johnson & Anderson, Inc.  
2300 Dixie Highway  
Pontiac, Michigan 48055

Amount & Year: \$9,780.00 -01

Started: June 1, 1967

Expected Finish: October 15, 1967

Objective: To evaluate the economic feasibility of constructing a refuse and sewage sludge composting plant in the city of Riverview with particular attention to the market value and quantity of the finished compost and salvaged material.

Procedures: The existing marketing channels in the Southern States for refuse compost will be reviewed and evaluated. The present marketing channels for chemical fertilizer in the Michigan area will be surveyed, analyzed, and reported. The methods of bulk shipping, primarily rail and truck, will be investigated. The capital and operating costs for refuse composting plants of various capacities will be developed and reported. The project will be culminated in a written report outlining the results of the survey and conclusions as to the economics of composting.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00093-01

Title: Demonstration of Solid Waste Disposal Machine and Consolidation of Several Separate Disposal Operations Into One County Operated Project

Project Director: William M. Friedman, Jr.  
Assist. Commissioner for Env. Health  
Niagara County Health Department  
525 Dewley Building  
Lockport, New York 14094

Amount & Year: \$544,525-01  
\$ 98,544-02

Started: June 1, 1967

Expected Finish: May 31, 1969

Objective: To demonstrate the feasibility of consolidating and centralizing the solid waste disposal facilities of Niagara County with a population of 250,000 into one regional solid waste management under an established county agency. The project will demonstrate the capabilities of a newly developed landfill compaction machine. It also proposed to rehabilitate 13 existing disposal sites which are to be abandoned, therefore eliminating numerous existing nuisance conditions.

Procedures: The Solid Waste Agency has been established to serve Niagara County in its solid wastes affairs. The Agency proposes for its first project to establish two county sanitary landfills. One site will use the newly developed D&J Press refuse machine, while the other will use standard landfill equipment. The D&J Press refuse machine, which is capable of receiving, compacting, and covering refuse at a rate of 35 tons per hour, will be tested and evaluated. All solid waste received will be weighed and recorded. Complete records will be kept on the operational costs of the operation and of the operational difficulties of the machine. An economic study will be conducted on the site with ordinary landfill equipment to determine the feasibility of converting this site to a transfer station. Existing disposal sites will be closed and rehabilitated during the project period.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00095-1

Title: Comprehensive Study of Solid Waste Disposal-Cascade  
County, Montana

Project Director: John A. Googins, M. D.  
Health Officer  
City-County Health Department  
1130 - 17th Avenue South  
Great Falls, Montana 59401

Amount & Year: \$57,000-01

Started: June 1, 1967

Expected Finish: May 31, 1968

Objective: Cascade County, Montana proposes:

- 1) To investigate and define existing conditions as to solid waste storage, collection and disposal in the county.
- 2) To determine the most economical, efficient and effective methods for storing, collecting and disposing of solid wastes in the county.
- 3) To implement study findings by preparing a comprehensive solid waste disposal report for Cascade County.

Procedures: The study will be conducted through the joint efforts of the County of Cascade, City of Great Falls, City of Belt, the Towns of Cascade and Neihart and the consulting engineering firm, Thomas Dean and Hoskins, Inc. Inventories of existing facilities and practices will be prepared. Determination of the most economical, efficient and effective methods of storage, collection and disposal will be made. Implementation will be in the form of a final report which will include a regional collection plan, development of alternative methods of disposal, recommended ordinances or regulations to provide effective utilization, and a public relations program to gain public support.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00097-1

Title: Shredding of Bulky Solid Wastes for New York City

Project Director: Maurice M. Feldman, P. E.  
Deputy Commissioner, Engineering  
Department of Sanitation  
125 Worth Street  
New York, New York 10013

Amount & Year: \$2,151,000 - 01

Started: June 1, 1967

Expected Finish: May 31, 1968

Objective: This project provides for the development, design, and construction of a facility in the City of New York to shear and shred, or otherwise reduce, the widest possible range of bulky solid wastes to manageable size for the effective and useful disposal in waterfront land recovery, sanitary landfill, or for preparation for incineration. This facility must be capable of handling 975 tons/day of oversized solid wastes.

Procedures: Prior to this project, the City of New York hired a consulting engineer to conduct a preliminary study which involved studying all existing shearing-grinding apparatus and reporting as to whether the City can use existing machinery or whether new types of equipment must be developed. The first phase of the demonstration project will begin by preparing from this preliminary study a detailed report which will consist of plans and specifications of the installation. Once this report is completed, construction of the 975 ton/day shredder will begin. Upon completion of the shredder, an independent testing agency, J. G. White Engineering Corporation, will be employed to record and evaluate the actual overall economics of operation. Parameters used in the report will include (a) outage rates, (b) feeding rates, (c) shredding rates, (d) power consumption, (e) direct operating costs, (f) indirect and maintenance costs, and (g) amortization costs. Truck scales will be installed for measurement of shredded waste output. Interim and final test reports, documenting the City's experience with the installation will also be issued.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00102-01

Title: Dairy Manure Management Methods - Monroe, Washington

Project Director: Dr. Donald E Proctor  
Associate Sanitary Engineer  
Sanitary Engineering Section  
College of Engineering Research Division  
Washington State University  
Pullman, Washington 99163

Amount & Year: \$336.767 -01            \$134,083 -02            \$139,445 -03

Started: June 1, 1967            Expected Finish: May 31, 1970

Objective: The Washington State University proposes to work with the State Reformatory Honor Farm at Monroe, Washington to demonstrate facilities and techniques that will reduce the possibility of dairy manure's being washed or carried into streams, increase the fertilizer values actually realized, and hopefully, reduce the cost and unpleasant aesthetic considerations now associated with the management of this solid waste.

Procedures: A system of three independent anerobic lagoons will be used for both storage of the manure and degradation of the most putrescible constituents. Variations in the rates of loading and in the depth and volumes of the lagoons are two of the many variables to be experimented with in this project. The manure will ultimately be applied to fields but only during the drier seasons of the year when run-off is least likely and when the need for the fertilizer constituents is highest. Evaluation of all phases of the project will be carried on by a staff drawn from the Washington State University's Sanitary Engineering Section, Department of Animal Sciences, and Department of Agronomy. Complete documentation and evaluation will be provided through papers, reports and speeches presented throughout the duration and at the conclusion of the project.

Project Type: Study/Invest/Demon. Grant Agency No. 1-D01-SW-00106-01

Title: Demonstration of Improved Incinerator Technology for a  
Small Community

Project Director: Walter K. Smith  
Borough Manager  
Borough of Shippensburg  
P. O. Box 129  
Shippensburg, Pennsylvania 17257

Amount & Year: \$204,813-01  
\$ 20,100-02  
\$ 20,100-03

Started: June 1, 1967 Expected Finish: May 31, 1970

Objective: To demonstrate that a small mechanically stoked rotary grate incinerator can provide a small municipal area with a feasible means for the disposal of solid wastes which will meet Air Pollution standards, eliminate environmental health hazards, and be the most economical method of disposal in an area where sanitary landfill methods cannot be adopted.

Procedures: The Borough of Shippensburg will construct, demonstrate, and evaluate a stainless steel, perforated rotary grate incinerator. The proposed unit is manufactured by the Kennedy Van Saun Corporation.

Records will be kept of the operation of the incinerator. They will include the weight of refuse fed into the incinerator, the amount of residue produced, the type and water content of refuse received, the amount of time needed to incinerate and average load of refuse, the actual operating costs of the incinerator, and various difficulties and problems of operation, should there be any. The Borough also hopes to demonstrate that the incinerator residue can be used as fine material in the soil cement stabilization process.